Apprenticeship and Industry Training

Lather – Interior Systems Mechanic

Apprenticeship Course Outline

1709 (2009)

Alberta

Apprenticeship and Industry Training

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Lather-Interior Systems Mechanic
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Apprenticeship

Apprenticeship is post-secondary education with a difference. Apprenticeship begins with finding an employer. Employers hire apprentices, pay their wages and provide on-the-job training and work experience. Approximately 80 per cent of an apprentice's time is spent on the job under the supervision of a certified journeyperson or qualified tradesperson. The other 20 per cent involves technical training provided at, or through, a post-secondary institution – usually a college or technical institute.

To become certified journeypersons, apprentices must learn theory and skills, and they must pass examinations. Requirements for certification—including the content and delivery of technical training—are developed and updated by the Alberta Apprenticeship and Industry Training Board on the recommendation of Lather-Interior Systems Mechanic Provincial Apprenticeship Committee

The graduate of the Lather-Interior Systems Mechanic apprenticeship program is a certified journeyperson who will be able to:

- know the characteristics and understand the actions and interactions of Lathing and Interior Systems Mechanic materials
- interpret plans and specifications and layout and develop projects accordingly
- calculate material quantities
- use hand tools and powered equipment in a proper and safe manner
- construct various types of walls and ceilings and apply exterior and interior trim of metal and other material
- relate to the work of other tradespeople in the building industry
- perform assigned tasks in accordance with quality and production standards required in industry.

Apprenticeship and Industry Training System

Industry-Driven

Alberta's apprenticeship and industry training system is an industry-driven system that ensures a highly skilled, internationally competitive workforce in more than 50 designated trades and occupations. This workforce supports the economic progress of Alberta and its competitive role in the global market. Industry (employers and employees) establishes training and certification standards and provides direction to the system through an industry committee network and the Alberta Apprenticeship and Industry Training Board. The Alberta government provides the legislative framework and administrative support for the apprenticeship and industry training system.

Alberta Apprenticeship and Industry Training Board

The Alberta Apprenticeship and Industry Training Board provides a leadership role in developing Alberta's highly skilled and trained workforce. The board's primary responsibility is to establish the standards and requirements for training and certification in programs under the Apprenticeship and Industry Training Act. The board also provides advice to the Minister of Advanced Education and Technology on the needs of Alberta's labour market for skilled and trained workers, and the designation of trades and occupations.

The thirteen-member board consists of a chair, eight members representing trades and four members representing other industries. There are equal numbers of employer and employee representatives.

Industry Committee Network

Alberta's apprenticeship and industry training system relies on a network of industry committees, including local and provincial apprenticeship committees in the designated trades, and occupational committees in the designated occupations. The network also includes other committees such as provisional committees that are established before the designation of a new trade or occupation comes into effect. All trade committees are composed of equal numbers of employer and employee representatives. The industry committee network is the foundation of Alberta's apprenticeship and industry training system.

Local Apprenticeship Committees (LAC)

Wherever there is activity in a trade, the board can set up a local apprenticeship committee. The board appoints equal numbers of employee and employer representatives for terms of up to three years. The committee appoints a member as presiding officer. Local apprenticeship committees:

- monitor apprenticeship programs and the progress of apprentices in their trade, at the local level
- make recommendations to their trade's provincial apprenticeship committee (PAC) about apprenticeship and certification in their trade
- promote apprenticeship programs and training and the pursuit of careers in their trade
- make recommendations to the board about the appointment of members to their trade's PAC
- help settle certain kinds of disagreements between apprentices and their employers
- carry out functions assigned by their trade's PAC or the board

Provincial Apprenticeship Committees (PAC)

The board establishes a provincial apprenticeship committee for each trade. It appoints an equal number of employer and employee representatives, and, on the PAC's recommendation, a presiding officer - each for a maximum of two terms of up to three years. Most PACs have nine members but can have as many as twenty-one. Provincial apprenticeship committees:

- Make recommendations to the board about:
    - standards and requirements for training and certification in their trade
    - courses and examinations in their trade
    - apprenticeship and certification
    - designation of trades and occupations
    - regulations and orders under the Apprenticeship and Industry Training Act
- monitor the activities of local apprenticeship committees in their trade
- determine whether training of various kinds is equivalent to training provided in an apprenticeship program in their trade
- promote apprenticeship programs and training and the pursuit of careers in their trade
- consult with other committees under the Apprenticeship and Industry Training Act about apprenticeship programs, training and certification and facilitate cooperation between different trades and occupations
- consult with organizations, associations and people who have an interest in their trade and with employers and employees in their trade
- may participate in resolving certain disagreements between employers and employees
- carry out functions assigned by the board

Lather-Interior Systems Mechanic PAC Members at the Time of Publication

Mr. D. Wiebe	Edmonton	Presiding Officer
Mr. A. Sim	Riviere Qui Barre	Employer
Mr. J. Hesp	Edmonton	Employer
Mr. L. Lewandoski	Edmonton	Employee
Mr. B. Mallow	Calgary	Employee
Mr. K. Stanwood	Calgary	Employer
Mr. T. Van Dyk	Calgary	Employer
Mr. D. Millar	Edmonton	Employee

Alberta Government

Alberta Advanced Education and Technology works with industry, employer and employee organizations and technical training providers to:

- facilitate industry's development and maintenance of training and certification standards
- provide registration and counselling services to apprentices and employers
- coordinate technical training in collaboration with training providers
- certify apprentices and others who meet industry standards

Technical Institutes and Colleges

The technical institutes and colleges are key participants in Alberta's apprenticeship and industry training system. They work with the board, industry committees and Alberta Advanced Education and Technology to enhance access and responsiveness to industry needs through the delivery of the technical training component of apprenticeship programs. They develop lesson plans from the course outlines established by industry and provide technical training to apprentices.

Apprenticeship Safety

Safe working procedures and conditions, incident/injury prevention, and the preservation of health are of primary importance in apprenticeship programs in Alberta. These responsibilities are shared and require the joint efforts of government, employers, employees, apprentices and the public. Therefore, it is imperative that all parties are aware of circumstances that may lead to injury or harm.

Safe learning experiences and healthy environments can be created by controlling the variables and behaviors that may contribute to or cause an incident or injury. By practicing a safe and healthy attitude, everyone can enjoy the benefit of an incident and injury free environment.

Alberta Apprenticeship and Industry Training Board Safety Policy

The Alberta Apprenticeship and Industry Training Board fully supports safe learning and working environments and encourages the teaching of proper safety procedures both within trade specific training and in the workplace.

Trade specific safety training is an integral component of technical training, while ongoing or general non-trade specific safety training remains the responsibility of the employer and the employee as required under workplace health and safety legislation.

Workplace Responsibilities

The employer is responsible for:

- training employees and apprentices in the safe use and operation of equipment
- providing and maintaining safety equipment, protective devices and clothing
- enforcing safe working procedures
- providing safeguards for machinery, equipment and tools
- observing all accident prevention regulations.

The employee and apprentice are responsible for:

- working in accordance with the safety regulations pertaining to the job environment
- working in such a way as not to endanger themselves, fellow employees or apprentices.

Workplace Health and Safety

A tradesperson is often exposed to more hazards than any other person in the work force and therefore should be familiar with and apply the Occupational Health and Safety Act, Regulations and Code when dealing with personal safety and the special safety rules that apply to all daily tasks.

Workplace Health and Safety (Alberta Employment, Immigration and Industry) conducts periodic inspections of workplaces to ensure that safety regulations for industry are being observed.

Additional information is available at www.worksafely.org

Technical Training

Apprenticeship technical training is delivered by the technical institutes and many colleges in the public post-secondary system throughout Alberta. The colleges and institutes are committed to delivering the technical training component of Alberta apprenticeship programs in a safe, efficient and effective manner. All training providers place great emphasis on safe technical practices that complement safe workplace practices and help to develop a skilled, safe workforce.

The following institutions deliver Lather-Interior Systems Mechanic apprenticeship technical training:

Northern Alberta Institute of Technology

Procedures for Recommending Revisions to the Course Outline

Advanced Education and Technology has prepared this course outline in partnership with the Lather-Interior Systems Mechanic Provincial Apprenticeship Committee.

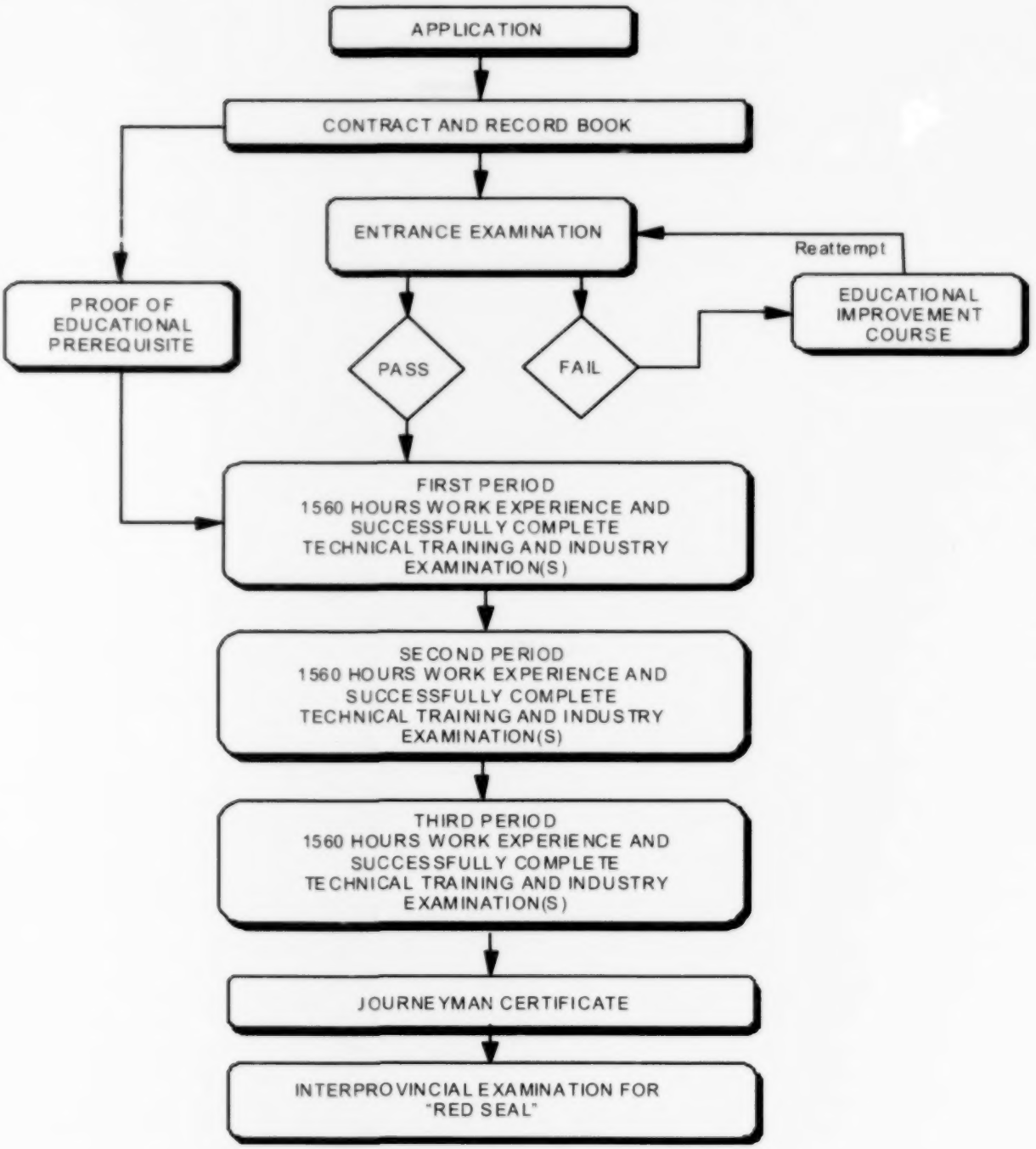
This course outline was approved on March 20, 2009 by the Alberta Apprenticeship and Industry Training Board on a recommendation from the Provincial Apprenticeship Committee. The valuable input provided by representatives of industry and the institutions that provide the technical training is acknowledged.

Any concerned individual or group in the province of Alberta may make recommendations for change by writing to:

Lather-Interior Systems Mechanic Provincial Apprenticeship Committee
c/o Industry Programs and Standards
Apprenticeship and Industry Training
Advanced Education and Technology
10th floor, Commerce Place
10155 102 Street NW
Edmonton AB T5J 4L5

It is requested that recommendations for change refer to specific areas and state references used. Recommendations for change will be placed on the agenda for regular meetings of the Lather-Interior Systems Mechanic Provincial Apprenticeship Committee.

Apprenticeship Route toward Certification



Lather-Interior Systems Mechanic Training Profile
FIRST PERIOD
(8 Weeks 30 Hours per Week – Total of 240 Hours)

SECTION ONE

CODES, REGULATIONS AND GENERAL SAFETY
16 HOURS

A	B	C
Apprenticeship System 2 Hours	Construction Safety 3 Hours	Project Organization 3 Hours
D	**E**	**F**
Study of Regulations 4 Hours	Fire Prevention and Controls 1 Hour	Introduction to WHMIS 3 Hours

SECTION TWO

TOOLS, EQUIPMENT AND MATERIALS
17 HOURS

A	B	C
Hand and Power Tools 4 Hours	Scaffolding 4 Hours	Materials 3 Hours
D		
Explosive Actuated Tools 6 Hours		

SECTION THREE

WALLS
45 HOURS

A	B	C
Various Types and Specifications 2 Hours	Materials and Erection 8 Hours	Metal Framing 21 Hours
D	**E**	**F**
Furring Systems on Existing Walls 4 Hours	Preparations for Other Trades 4 Hours	Application of Insulation In Walls and Ceilings 6 Hours

SECTION FOUR

EXTERIOR STUCCO PREPARATION
10 HOURS

A	B
Sheathing and Building Paper 5 Hours	Stucco Wire and Coatings 5 Hours

SECTION FIVE

DRYWALL APPLICATIONS
46 HOURS

A	B	C
Application, Layout and Installation 18 Hours	Taping 12 Hours	Drywall Ceiling Systems 16 Hours

SECTION SIX

COMPONENT CEILING SYSTEMS
30 HOURS

A	B
Component Ceilings 25 Hours	Component Baffles 5 Hours

SECTION SEVEN

AIR AND MOISTURE BARRIERS
12 HOURS

A	B	C
Application of Air and Moisture Barriers 6 Hours	Barrier Failures 3 Hours	Exterior Insulation Finish Systems (EIFS) 3 Hours

SECTION EIGHT

BLUEPRINT READING
36 HOURS

A	B	C
Drawing Instruments and Techniques 8 Hours	Freehand Sketch 8 Hours	Drawing to Specifications 8 Hours
D		
Blueprint Interpretation 12 Hours		

SECTION NINE	A	B	C
TRADE MATHEMATICS 28 HOURS	Basic Applied Mathematics 12 Hours	Trade Problems from Basic Plans and Specifications 12 Hours	Metric Systems 4 Hours

SECOND PERIOD
(8 Weeks 30 Hours per Week – Total of 240 Hours)

SECTION ONE	A	B	
FIRE RESISTIVE AND ACCOUSTICAL RATINGS 8 HOURS	Fire and Sound Ratings 4 Hours	Wall and Ceiling Designs 4 Hours	
SECTION TWO	A	B	C
WIND/LOAD BEARING WALL AND FLOOR SYSTEMS 30 HOURS	Wind Bearing Framing Systems 10 Hours	Composite Metal Floor Systems and Load Bearing Walls 10 Hours	Access Floor Systems 10 Hours
SECTION THREE	A		
METAL LATH PARTITIONS, WALLS AND CEILINGS 14 HOURS	Fabricating of Metal Lath Partitions, Walls and Ceilings 14 Hours		
SECTION FOUR	A	B	
SHAFT WALL SYSTEMS 28 HOURS	Shaft Wall Fabrication 12 Hours	Plenum Barriers 16 Hours	
SECTION FIVE	A	B	C
COMPONENT AND SPECIALTY CEILING SYSTEMS 40 HOURS	Concealed Suspension Ceiling System 2 Hours	Reveal Grid and Ceiling Tile System 12 Hours	Metal Linear Ceiling Systems 6 Hours
	D		
	Specialty Ceilings 20 Hours		
SECTION SIX	A		
DEMOUNTABLE PARTITION SYSTEMS 20 HOURS	Components and Installation 20 Hours		
SECTION SEVEN	A	B	C
SPECIALIZED SYSTEMS 28 HOURS	Pre-cast Plaster, Glass Fibre and Reinforced Gypsum 4 Hours	Component Wall Treatment and Baffles 4 Hours	Jigs and Templates 20 Hours
SECTION EIGHT	A	B	C
EXTERIOR INSULATION FINISH SYSTEMS (EIFS) 24 HOURS	Panelization 4 Hours	On-Site Application 18 Hours	Air and Moisture Barriers 2 Hours
SECTION NINE	A	B	C
BLUEPRINT READING 36 HOURS	Blueprints for Commercial Buildings 12 Hours	Isolating the Lather – Interior Systems Mechanic Work 10 Hours	Amplifying Drawings with Notes 4 Hours

	D	E	
	Freehand Pictorial Drawings 5 Hours	Specified Shop Projects 5 Hours	
SECTION TEN	A		
TRADE MATHEMATICS 12 HOURS ⇨	Trade Calculations 12 Hours		

THIRD PERIOD
(8 Weeks 30 Hours per Week – Total of 240 Hours)

SECTION ONE	A	B	C
ADVANCED CEILING SYSTEMS 56 HOURS ⇨	Adjustments and Adaptations from Regular Layouts 6 Hours	Component Ceilings 2 Hours	Groined Drywall and Domed Metal Lath Ceiling 20 Hours
	D	E	F
	Specialty Ceilings 10 Hours	Development and Use Of Jigs and Templates 6 Hours	Trim and Finishing Components 12 Hours
SECTION TWO	A	B	C
RENOVATIONS, WALLS AND FIREPROOFING 30 HOURS ⇨	Demountable Partition Systems 10 Hours	Fireproofing 10 Hours	Renovations and Additions 10 Hours
SECTION THREE	A	B	
SPECIALIZED ENVIRONMENTS 10 HOURS ⇨	Introduction to Specialized Environments 6 Hours	Radiation Protective Systems 4 Hours	
SECTION FOUR	A	B	C
BLUEPRINT READING 63 HOURS ⇨	Specifications 10 Hours	Blueprints with Emphasis on Lather – ISM Role 20 Hours	Working Drawings 22 Hours
	D		
	Job Organization 11 Hours		
SECTION FIVE	A	B	C
BUSINESS FUNDAMENTALS 41 HOURS ⇨	Documents and Forms 6 Hours	Trade Math 18 Hours	Workplace Coaching Skills 5 Hours
	D		
	Interprovincial Standards 12 Hours		
	A		
FINAL PERIOD PRACTICAL PROJECT 40 HOURS ⇨	Final Period Practical Examination 40 Hours		

NOTE: The hours stated are for guidance and should be adhered to as closely as possible. However, adjustments must be made for rate of apprentice learning, statutory holidays, registration and examinations for the training establishment and Apprenticeship and Industry Training.

FIRST PERIOD TECHNICAL TRAINING
LATHER-INTERIOR SYSTEMS MECHANIC TRADE
COURSE OUTLINE

UPON SUCCESSFUL COMPLETION OF THIS PROGRAM THE APPRENTICE SHOULD BE ABLE TO PERFORM THE FOLLOWING OUTCOMES AND OBJECTIVES.

SECTION ONE: ..... CODES, REGULATIONS AND GENERAL SAFETY ..... 16 HOURS

A. Apprenticeship System ..... 2 Hours

Outcome: ***Explain the role and purpose of the advisory network and Provincial Apprenticeship Committee structure for the Lather/ISM trade.***

1. Describe the structure and purpose of local and provincial apprenticeship committees.
2. State the process involving the Contract of Apprenticeship and Record Book.
3. Outline the Training Profile for the Lather/ISM Trade.
4. Be aware of the need for compliance with Apprenticeship Act and Regulations.

B. Construction Safety ..... 3 Hours

Outcome: ***Demonstrate knowledge of codes, regulations and general safety.***

1. Reference to the National Building Code and the Alberta Building Code.
2. Explain the function of Canadian Standards Association and the Underwriters Laboratories of Canada.
3. Identify and observe Occupational Health and Safety regulations as they pertain to the Lather - ISM trade.
4. Be familiar with procedures, application forms, calculations, etc. within the various Acts and Regulations:
   a) Income Tax
   b) Workers Compensation
   c) Holiday pay
   d) Employment Insurance.

C. Project Organization ..... 3 Hours

Outcome: ***Explain the roles and responsibilities within the industry.***

1. Explain the role of the owner, architects and engineers.
2. Explain the role of the general contractor.
3. Discuss sub-trades and how Lather - Interior Systems Mechanic must work with each.
4. Explain the role of the Lather and Interior Systems Mechanic.
5. Explain the responsibilities of the employer, supervisor and employee.

D. Study of Regulations .....4 Hours

Outcome: ***Understand construction safety regulations.***

1. Discuss first aid and regulations with reference to emergency procedures and obtaining assistance for an injured worker.
2. Describe the procedures for obtaining first aid certificate(s).
3. Outline the regulations for general accident prevention:
   a) general safety precautions
   b) housekeeping
   c) personal protective equipment
   d) clothing
   e) safety belts, lifelines, safety nets
   f) respiratory protective equipment.
4. Specify the construction safety regulations for:
   a) wooden construction ladders
   b) protection from falling materials
   c) material hoists
   d) scaffolds - general
   e) ramps, runaways and stairways
   f) rolling scaffold and self-propelled
   g) suspended and swing stage scaffolds
   h) perimeter guard rails
   i) power man lift
   j) asbestos abatement
   k) general electrical safety
   l) laser lights in construction.

E. Fire Prevention and Controls.....1 Hour

Outcome: ***Explain fire prevention techniques.***

1. Identify the classes of fires and the acceptable extinguishers.
2. Define the critical areas in construction.

F. Introduction to W.H.M.I.S. (Workplace Hazardous Materials Information System) .....3 Hours

Outcome: ***Ability to handle hazardous materials safely.***

1. Define what a WHMIS label means and distinguish between supplier and workplace labels and other means of identification.
2. Explain what a Material Safety Data Sheet (MSDS) is, its purpose and limitations.
3. Describe the roles and responsibilities of employer, supplier and worker in the education of workers.

SECTION TWO: .....TOOLS, EQUIPMENT AND MATERIALS .....17 HOURS

A. Hand and Power Tools .....4 Hours

Outcome: ***Select, use and maintain hand and power tools.***

1. Discuss tools with emphasis on names and working parts.
2. Demonstrate tool safety.
3. Discuss typical and occasional job applications.
4. Recognize the components, assembly, types, sizes and the care, maintenance and safe use of:
   a) measuring tools
   b) layout tools
   c) gypsum cutting tools
   d) metal cutting tools
   e) crimping and riveting tools
   f) spirit and hydro leveling tools
   g) boring tools
   h) bending and tying tools
   i) impact tools
   j) screw driving tools
   k) sharpening tools
   l) power extension cords and polarity plugs
   m) caulking tools
   n) laser instruments.

B. Scaffolding.....4 Hours

Outcome: ***Erect, use and dismantle scaffolding.***

1. Describe the typical and occasional job applications.
2. Discuss ladders.
3. Describe rolling and motorized scaffolds.
4. Describe the erection and dismantling of typical scaffolding used in industry.

C. Materials.....3 Hours

Outcome: ***Select materials for use on the job site.***

1. Describe the metal types and gauges.
2. Explain the composition of gypsum and its manufacturers.
3. Explain the acceptable temperatures for set-up of gypsum and other adhesives.
4. Describe the typical and special fasteners.
5. Discuss the common causes of breakage and damage.
6. Outline the housekeeping practices.
7. Explain point loading.

D. Explosive Actuated Tools ..... 6 Hours

Outcome: ***Use and maintain powder, gas and pneumatic activated tools.***

1. Describe low velocity tools, how they operate and the different types of fasteners and charges.
2. Demonstrate operation and explain the relationship between pins, charges and materials.
3. Discuss the hidden features of fastening surfaces.
4. Discuss servicing and storage of tools and supplies, and the disposal of misfired charges.
5. Demonstrate the pre-firing routine and the actual firing of a low velocity tool.

SECTION THREE: ..... WALLS ..... 45 HOURS

A. Various Types and Specifications ..... 2 Hours

Outcome: ***Identify the different walls used in the trade.***

1. Differentiate between bearing, non-bearing, prefabricated and shaft walls.

B. Materials and Erection ..... 8 Hours

Outcome: ***Select and install materials.***

1. Identify the use of floor and ceiling channels.
2. Choose stud types and spacing.
3. Identify the layout and aligning methods.
4. Describe securing systems.
5. Describe bracing procedures.
6. Explain how to establish wall openings.
7. Install backing systems.

C. Metal Framing ..... 21 Hours

Outcome: ***Layout and install metal framing.***

1. Demonstrate the following:
   a) floor layout
   b) floor and ceiling runner
   c) plumbing and aligning procedures
   d) various metal stud types - load bearing and non-load bearing
   e) bracing procedures
   f) intersecting walls
   g) window, door and access openings
   h) installation of frames
   i) resilient sound bars.

D. Furring Systems on Existing Walls ..... 4 Hours

Outcome: ***Install a furring system.***

1. Describe the correct spacing.
2. Describe shimming and securing procedures.
3. Describe the securing systems required.
4. Describe furring procedures on concrete and masonry walls.

E. Preparations for Other Trades ..... 4 Hours

Outcome: ***Install backing and recessed openings for other trades.***

1. Describe the installation of backing and brackets for:
   a) electrical fixtures
   b) plumbing fixtures
   c) wood or metal cabinets.
2. Prepare opening for fire hose cabinets and recessed fixtures.

F. Application or Installation of Insulation in Walls and Ceilings ..... 6 Hours

Outcome: ***Select and install insulation.***

1. Explain the types and thickness of insulation.
2. Explain and install vapour barriers.
3. Identify how to secure or fasten insulation.
4. Explain heat transfer and heat loss.
5. Comprehend attenuation and absorption.
6. Install insulation:
   a) batt type
   b) rigid type.

SECTION FOUR: ..... EXTERIOR STUCCO PREPARATION ..... 10 HOURS

A. Sheathing and Building Paper ..... 5 Hours

Outcome: ***Select and apply sheathing and building paper.***

1. Identify wood sheathing and application.
2. Identify exterior gypsum and application.
3. Select and use fasteners.
4. Differentiate between:
   a) asphalt impregnated
   b) air barrier paper.
5. Select and use building paper.
6. Select and use flashing.

B. Stucco Wire and Coatings ..... 5 Hours

Outcome: ***Select and apply stucco wire and coatings.***

1. Describe standard welded wire and standard welded wire paper backed stucco wire.
2. Select and use stucco wire.
3. Differentiate among:
   a) scratch
   b) brown
   c) finish.
4. Discuss finish stucco for:
   a) stone dash
   b) decorative uses.

SECTION FIVE: ..... DRYWALL APPLICATIONS ..... 46 HOURS

A. Application, Layout and Installation ..... 18 Hours

Outcome: ***Select and install drywall systems.***

1. Discuss the use of single layer drywall:
   a) apply single layer gypsum
   b) identify the location and spacing for nails and screws.
2. Explain standard lamination:
   a) apply standard lamination gypsum
   b) identify the location and spacing for nails and screws
   c) prepare and apply adhesives.
3. Specify where to use nails, screws, adhesives, etc.
4. Properly make dimension selection (thickness and length).
5. Describe patterns or sequence of joints.
6. Measure and cut to size.
7. Locate and cut out openings and outlets.
8. Describe how and where to apply backing board.

B. Taping ..... 12 Hours

Outcome: ***Select and apply drywall tape and taping compounds.***

1. Select different types of joint compounds and trims.
2. Demonstrate the application of joint compounds and trims.
3. Identify and apply different types of tapes
4. Outline and demonstrate the various levels of finish.
5. Knowledge of sanding methods and types of sanding papers and equipment.

C. Drywall-Ceiling Systems ..... 16 Hours

Outcome: ***Select and install drywall-ceiling systems.***

1. Build projects that include the use of inserts, hangers, eye pins, nails, screws, clips and bolts.

2. Select and install carrying and secondary channels.
3. Establish elevations with laser, hydro levels (including reservoir type).
4. Outline and demonstrate bending and tying techniques.
5. Develop and install bracing systems.
6. Describe how to lift and secure heavy sheets.
7. Describe the material thickness for various joists, truss and channel spacing.
8. Bend and form channels.
9. Layout and fabricate openings to receive:
   a) electrical fixtures
   b) access panels.
10. Layout and fabricate:
    a) vertical drops and returns
    b) false beams.

SECTION SIX: ..... COMPONENT CEILING SYSTEMS ..... 30 HOURS

A. Component Ceilings ..... 25 Hours

Outcome: ***Select and install component ceiling systems.***

1. Describe ceiling board and tile, with reference to:
   a) composition types
   b) edge details
   c) physical properties - noise reduction, coefficiency and sound transmission class.
2. State the classifications of the Underwriters Laboratories of Canada:
   a) fire hazard
   b) fire resistive.
3. Explain suspension systems with exposed grid.
4. Describe cement-up applications and prepare cement-up with:
   a) layout
   b) technique for adhesion application.
5. Install an exposed modular grid with:
   a) layout
   b) vertical ceiling drops and returns
   c) open peripheral details.
6. Discuss and determine fire resistive requirements for fixture enclosures and duct openings.

B. Component Baffles ..... 5 Hours

Outcome: ***Select and install baffle systems.***

1. Install steel studs along with the insulation, caulking and gypsum board.

SECTION SEVEN: ..... AIR AND MOISTURE BARRIERS ..... 12 HOURS

A. Application of Air and Moisture Barriers ..... 6 Hours

Outcome: ***Install air and moisture barriers.***

1. List and describe principles and fundamentals.
2. Describe types of air and moisture barriers including:
   a) conventional polyethylene barrier
   b) self adhesive modified
   c) asphalt sheet - peel and stick
   d) torch-on.
3. Describe tools and equipment used in preparation and application.
4. Demonstrate application procedure including:
   a) conventional polyethylene
   b) self adhesive modified asphalt sheet - peel & stick.

B. Barrier Failures ..... 3 Hours

Outcome: ***Recognize defective and/or improper applications.***

1. Describe softening point of bitumen.
2. Describe the effect of overheating barriers.
3. List and describe compatibility of material.

C. Exterior Insulation Finish Systems (EIFS) ..... 3 Hours

Outcome: ***Identify and layout EIFS systems.***

1. Describe panelization and installation procedures.
2. Describe on-site fabrication.
3. Demonstrate the ability to layout projects.
4. List and describe exterior sheathing and fasteners.
5. Explain purpose of flashing.
6. Install insulation board to sheathing with adhesives and/or mechanical fasteners.
7. Demonstrate the ability to embed reinforcing mesh to insulation board.

SECTION EIGHT: ..... BLUEPRINT READING ..... 36 HOURS

A. Drawing Instruments and Techniques ..... 8 Hours

Outcome: ***Select and use drawing instruments and techniques.***

1. Explain object, extension, centre, hidden and break lines.
2. Use drawing instruments to draw lines.
3. Use drawing instruments to draw numbers and upper case lettering.

B. Freehand Sketch ..... 8 Hours

Outcome: ***Draw a freehand sketch.***

1. Make simple drawings of trade symbols.

2. Make basic drawings as an aid to understanding glossaries.

C. Drawing to Specifications ..... 8 Hours

Outcome: Interpret drawings to construct details.

1. Make basic orthographic and isometric drawings.
2. Draw plans and elevation views for projects.

D. Blueprint Interpretation ..... 12 Hours

Outcome: Interpret blueprints to construct a project.

1. Read plan, elevation and section views.
2. Isolate Lather - Interior System Mechanic items on plans.
3. Understand the scope and responsibilities of other trades.
4. Draw reflected ceiling plans.

SECTION NINE: ..... TRADE MATHEMATICS ..... 28 HOURS

A. Basic Applied Mathematics ..... 12 Hours

Outcome: Perform calculations on the jobsite.

1. Do mathematical problems in addition, multiplication, division and subtraction.
2. Calculate common and decimal fractions.
3. Calculate linear, area and volume measurements.
4. Calculate ratios and proportions.
5. Calculate percentages.

B. Trade Problems From Basic Plans and Specifications ..... 12 Hours

Outcome: Estimate material quantities.

1. Calculate linear footage of perimeters, partition layouts, etc. in regular and irregular outlines.
2. Calculate studs, channels, fasteners, bracing, rough openings, etc. in wall layouts of various types and spacing.
3. Calculate areas of rectangular, square and triangular shapes.
4. Determine numbers of gypsum sheets, bundles of gypsum and metal lath, etc. from various areas.
5. Calculate pounds, lots and areas of fasteners.
6. Show extra cutting and waste through poor or improper selection of materials on site.
7. Convert stated elevations to working feet and inches, squaring by 3-4-5 system, etc.
8. Calculate layout, locations and quantities of hangers, inserts, eye pins, carrying and secondary channels, bracing, etc. for typical suspended ceilings.

C. Metric Systems ..... 4 Hours

Outcome: Use and convert metric measurements.

1. Convert various units of measure.

SECOND PERIOD TECHNICAL TRAINING
LATHER-INTERIOR SYSTEMS MECHANIC TRADE
COURSE OUTLINE

UPON SUCCESSFUL COMPLETION OF THIS PROGRAM THE APPRENTICE SHOULD BE ABLE TO PERFORM THE FOLLOWING OUTCOMES AND OBJECTIVES.

Due to the nature of the work of the Lather - Interior Systems Mechanic, it is imperative that safety be taught on a continuous basis throughout the entirety of this course.
Special emphasis should be placed on weak areas of theory and shop that are evident from progressive tests and examinations administered throughout the course. The time required for such examinations and testing shall be allowed for in each area of instruction

SECTION ONE:.....FIRE RESISTIVE AND ACCOUSTICAL RATINGS..... 8 HOURS

A. Fire and Sound Ratings ..... 4 Hours

Outcome: ***Interpret ratings to select appropriate materials and methods for assemblies.***

1. Discuss the National Research Council.
2. Explain decibels.
3. Comprehend sound transmission.
4. Comprehend flame spread.
5. Comprehend heat transmission.
6. Comprehend smoke controls.

B. Wall and Ceiling Designs ..... 4 Hours

Outcome: ***Interpret designs to select appropriate materials and methods for assemblies.***

1. Recognize non-combustible materials used.
2. Describe the treatment of wall cavities.
3. Discuss sound bars and barriers.
4. Discuss sealants, etc.
5. Recognize probable causes of smoke and sound leakage through minute cracks, access openings, etc.

SECTION TWO:.....WIND/LOAD BEARING WALL AND FLOOR SYSTEMS ..... 30 HOURS

A. Wind Bearing Framing Systems ..... 10 Hours

Outcome: ***Install wind bearing walls and associated framing.***

1. Layout and install load bearing framing.
2. Install framing at openings.
3. Install bracing and channels with clips.
4. Install slip track.
5. Install fasteners.

B. Composite Metal Floor Systems, Load Bearing Walls and Roofs..... 10 Hours

Outcome: ***Identify and recognize construction methods.***

1. Install composite metal floor panels or framing system with fasteners.
2. Install end closures, perimeter trims and straps.
3. Knowledge of shoring and its application.
4. Knowledge of load bearing roof systems.

C. Access Floor Systems ..... 10 Hours

Outcome: ***Identify and recognize construction methods.***

1. Describe each of the following types:
   a) rigid core
   b) free standing
   c) particle core panels
   d) steel panels
   e) pedestal
   f) stringers.
2. Describe the installation of:
   a) ramps
   b) handrails
   c) steps
   d) cutting methods.
3. Install steel panel in 1800/600 rigid grid system - referring to:
   a) layout
   b) pedestals and stringers
   c) field panels
   d) peripheral cut panels.

SECTION THREE: ..... METAL LATH PARTITIONS, WALLS AND CEILINGS..... 14 HOURS

A. Fabricating of Metal Lath Partitions, Walls and Ceilings ..... 14 Hours

Outcome: ***Install metal lath.***

1. Explain the make-up of studded walls.
2. Identify wnere metal lath is specified.
3. Give the advantages and limitations.
4. Describe and install ceiling and floor runners.
5. Describe plumbing and aligning procedures.
6. Describe vertical members.
7. Describe metal lath.
8. Describe bead stops and expansion joints.
9. Install:
   a) control joints
   b) expansion joints

c) corner beads
d) plaster stops.

SECTION FOUR: ..... SHAFT WALL SYSTEMS ..... 28 HOURS

A. Shaft Wall Fabrication ..... 12 Hours

Outcome: Install a shaft wall system.

1. Discuss the fire rating value.
2. Plumb and align system.
3. Layout shaft wall system.
4. Describe openings and frames.
5. Install coreboard to predetermined specifications.
6. Install finish layer as specified.

B. Plenum Barriers ..... 16 Hours

Outcome: Identify and construct plenum barriers.

1. Describe types of plenum barriers.
2. Install double layered gypsum board.
3. Install fibrous rigid insulation.
4. Install metal lath/security mesh.

SECTION FIVE: .....COMPONENT CEILING SYSTEMS ..... 40 HOURS

A. Concealed Suspension Ceiling System ..... 2 Hours

Outcome: Select components of and install a concealed suspension ceiling system.

1. Describe concealed suspension systems including:
   a) T
   b) metal pans.

B. Reveal Grid and Ceiling Tile Systems ..... 12 Hours

Outcome: Select components of and install a reveal grid and ceiling tile system.

1. 1. Describe exposed reveal systems with:
   a) exposed T, reveal edge ceiling board
   b) reveal grid, reveal edge ceiling board
   c) differences between various grid systems and profiles.
2. Layout system in accordance with peripheral details.
3. Install grid and ceiling board.
4. Construct vertical ceiling drops and slope returns.
5. Explain interfacing with electrical and mechanical.

C. Metal Linear Ceiling Systems ..... 6 Hours

Outcome: ***Select and install metal linear systems.***

1. Describe and construct metal linear suspension systems and beams.
2. Describe and use steel and plastic filler strips.
3. Describe the use of insulation pads.
4. Discuss and layout:
   a) hangers
   b) interfacing with electrical and mechanical
   c) peripheral detail.
5. Demonstrate cutting methods of:
   a) power mitre saws
   b) metal cutting hand tools.
6. Describe vertical ceiling returns.
7. Describe framing and furring of wall surfaces.
8. Explain the differences between interior and exterior applications.

D. Specialty Ceilings ..... 20 Hours

Outcome: ***Select and install specialty-ceiling systems.***

1. Describe various types of specialty ceilings (i.e. Axiom, Compasso, Curvatura etc.).
2. Explain reflective finishes, with reference to:
   a) cutting
   b) handling and storage.
3. Describe and install curved ceilings, with reference to:
   a) sub-framing
   b) templates and jigs.
4. Discuss and install angular ceilings, with reference to:
   a) layout
   b) suspension system framing.
5. Discuss and locate penetrations for:
   a) interfacing with electrical
   b) interfacing with mechanical.

SECTION SIX: ..... DEMOUNTABLE PARTITION SYSTEMS ..... 20 HOURS

A. Components ..... 20 Hours

Outcome: ***Select and install demountable partition systems.***

1. Define and use progressive systems and components.
   a) Discuss and use battenless referring to framing, patent fasteners, board and trimming material.
2. Define and use non-progressive systems and components.
   a) Discuss and use battenless and refer to framing, patent fasteners, board and trimming materials.

b) Discuss and use batten referring to framing, board and trimming materials.

3. Recognize the physical properties with emphasis on:
   a) sound transmission, class and gasketing
   b) fire resistive applications.
4. Describe and install the following:
   a) ceiling track details
   b) steel and aluminum door frames
   c) steel and aluminum glazed frames
   d) corners
   e) terminations
   f) intersections
   g) vinyl and fabric panels
   h) base details
   i) components systems differences.

SECTION SEVEN: ..... SPECIALIZED SYSTEMS ..... 28 HOURS

A. Precast Plaster, Glass Fiber and Reinforced Gypsum ..... 4 Hours

Outcome: Install precast plaster systems.

1. State the physical properties.
2. Discuss the delivery, storage and handling.
3. Discuss on-site installation.
4. Explain tolerances. (erected units)
5. Describe the methods for patching and cleaning.
6. Describe procedures for caulking precast plaster.
7. Describe procedures for finishing precast plaster.
8. Use correct installation techniques for:
   a) columns
   b) coffers
   c) cornices and valances.

B. Component Wall Treatment and Baffles ..... 4 Hours

Outcome: Install component wall treatment and baffle systems.

1. Discuss the following types and usage of:
   a) wall panels
   b) ceiling panels
   c) baffles and screens
   d) special panels.
2. Explain the typical layout and installation:
   a) layout
   b) elevations
   c) mounting.
3. Fasten component baffles to existing ceiling systems and structures.

C. Jigs and Templates ..... 20 Hours

Outcome: ***Develop and use jigs and templates.***

1. Explain the purpose, materials and design when used for:
   a) beam
   b) columns
   c) pilasters
   d) soffits
   e) coves, curved surfaces
   f) temporary and reusable types.
2. Develop jigs and templates for:
   a) beams
   b) soffits
   c) columns
   d) pilasters
   e) coves, curved surfaces.

SECTION EIGHT: ..... EXTERIOR INSULATION FINISH SYSTEMS (EIFS) ..... 24 HOURS

A. Panelization ..... 4 Hours

Outcome: ***Fabricate and install pre-manufactured panels.***

1. Describe panelization and installation procedures.
2. Describe on-site fabrication.

B. On-site Application ..... 18 Hours

Outcome: ***Select and install EIFS systems.***

1. Develop the layout.
2. Install exterior sheathing and fasteners.
3. Explain purpose of flashing.
4. Install insulation board to sheathing with adhesives and/or mechanical fasteners.
5. Embed reinforcing mesh to insulation board.
6. Apply finish coat referencing thickness, type of finish and colours available.

C. Air and Moisture Barriers ..... 2 Hours

Outcome: ***Install air and moisture barriers.***

1. List and describe principles and fundamentals.
2. Describe types of air and moisture barriers including:
   a) conventional polyethylene barrier
   b) self adhesive modified
   c) asphalt sheet - peel and stick
   d) torch-on.
3. Describe tools and equipment used in preparation and application.
4. Demonstrate application procedure including:

a) conventional polyethylene
b) self adhesive modified asphalt sheet - peel & stick.

SECTION NINE: ..... BLUEPRINT READING ..... 36 HOURS

A. Blueprints for Commercial Buildings ..... 12 Hours

Outcome: ***Interpret a complete set of blueprints (working drawings) to construct a project.***

1. Read and interpret:
   a) site plans
   b) structural plans
   c) mechanical plans
   d) architectural plans
   e) foundation plans
   f) electrical plans
   g) shop drawings.

B. Isolating the Lather - Interior Systems Mechanic Work ..... 10 Hours

Outcome: ***Determine the scope of work from a blueprint (working drawing).***

1. Read and interpret:
   a) specifications
   b) plan views and notes
   c) room finish schedules
   d) section and detail views
   e) elevations
   f) reflected ceiling plans.

C. Amplifying Drawings with Notes ..... 4 Hours

Outcome: ***Add detail notes to drawings.***

1. Amplify drawings with notes.

D. Freehand Pictorial Drawings ..... 5 Hours

Outcome: ***Draw a detailed freehand sketch.***

1. Draw quick freehand pictorial drawings for clarification of details and notes.
   a) chases
   b) curtain walls
   c) anchors
   d) baffles
   e) lintels
   f) corbels, haunches.

E. Specified Shop Projects ..... 5 Hours

Outcome: ***Produce a working drawing to build a class project.***

1. Draw blueprints for shop projects.

SECTION TEN: ..... TRADE MATHEMATICS..... 12 HOURS

A. Trade Calculations ..... 12 Hours

Outcome: ***Layout a project and calculate material quantities required.***

1. Calculate problems dealing with layouts, material sizes and quantities for false beams, soffits, etc.
2. Calculate layout patterns, material, types and quantities for:
   a) control joints
   b) expansion joints
   c) patented ceilings
   d) stepped ceilings
   e) fire rated walls
   f) sound rated walls.
3. Calculate layout and material quantities for circular and elliptical project:
   a) domed ceilings
   b) groined ceilings
   c) arches
   d) angles
   e) curves.

THIRD PERIOD TECHNICAL TRAINING
LATHER-INTERIOR SYSTEMS MECHANIC TRADE
COURSE OUTLINE

UPON SUCCESSFUL COMPLETION OF THIS PROGRAM THE APPRENTICE SHOULD BE ABLE TO PERFORM THE FOLLOWING OUTCOMES AND OBJECTIVES.

Due to the nature of the work of the Lather - Interior Systems Mechanic, it is imperative that safety be taught on a continuous basis throughout the entirety of this course.
Special emphasis should be placed on weak areas of theory and shop that are evident from progressive tests and examinations administered throughout the course. The time required for such examinations and testing shall be allowed for in each area of instruction.

PRACTICAL EXAMINATION ..... 40 HOURS

Every apprentice will be required to build an in shop practical project. This project will be assessed by representatives from industry and the marks obtained will be a major consideration in awarding completion of apprenticeship and journeyperson status.

SECTION ONE:..... ADVANCED CEILING SYSTEMS ..... 56 HOURS

A. Adjustments and Adaptations from Regular Layouts ..... 6 Hours

Outcome: ***Adapt methods to compensate for irregular jobsite conditions.***

1. Identify adjustments and adaptations for:
   a) mechanical concealment
   b) vertical steps
   c) sloping and curved surfaces
   d) extra securing and reinforcing for special loads
   e) valences, recesses for electric fixtures
   f) access openings, sky lights, false beams, chases, etc.

B. Component Ceilings..... 2 Hours

Outcome: ***Identify and install coffered ceilings.***

1. Explain the installation of integrated coffered ceilings at:
   a) columns
   b) drywall peripheral suspended ceilings.

C. Groined Drywall and Domed Metal Lath Ceiling ..... 20 Hours

Outcome: ***Install groined drywall and domed metal lath ceilings.***

1. Layout curves to specific measurements.
2. Secure metal and/or gypsum base or finish materials.
3. Explain scaffold systems.
4. Establish elevations, levels, radii and diameters.
5. Bend, form and secure channels.
6. Install beads, casings, etc.

D. Specialty Ceilings ..... 10 Hours

Outcome: Identify and install specialty ceilings.

1. Identify and install a specialty ceiling.

E. Development and Use of Jigs and Templates ..... 6 Hours

Outcome: Develop and use complex jigs and templates.

1. Develop and use the following jigs and templates:
   a) rectangular
   b) curved
   c) circular
   d) irregular.

F. Trim and Finishing Components ..... 12 Hours

Outcome: Select and install trims.

1. Apply trim and finishing components to curved, circular and irregular surfaces:
   a) beads
   b) perimeter moulds
   c) casings
   d) stops
   e) expansion and control joints.

SECTION TWO: ..... RENOVATIONS, WALLS AND FIREPROOFING ..... 30 HOURS

A. Demountable Partition Systems ..... 10 Hours

Outcome: Identify and install advanced pre-manufactured wall systems.

1. Describe a cornice height partition and refer to:
   a) framing
   b) bracing
   c) door and glazing header details.
2. Describe curved radii corner details.
3. Identify the following types:
   a) non-progressive flush batten
   b) non-progressive flush batten with recessed base and head.
4. Describe the following components:
   a) panel
   b) honeycomb core
   c) panel frame
   d) panel spline
   e) drywall membrane
   f) glazing units
   g) door units.

B. Fireproofing ..... 10 Hours

Outcome: ***Recognize, comprehend, and install specified fireproofing systems.***

1. Reference to ULC (Underwriters Laboratory of Canada) or other code requirements.
2. Explain the role in fabricating and preparing for gypsum coverings for structural steel.

C. Renovations and Additions ..... 10 Hours

Outcome: ***Identify, comprehend, and deal with unique situations.***

1. Recognize asbestos and abatement methods.
2. Describe existing services, cautions and disconnections.
3. Describe protection of existing floor, cabinets, etc.
4. Describe the removal of existing material and housekeeping.
5. Explain the layout and connection to existing walls.
6. Explain temporary shores, bracing, hoarding, etc.
7. Recognize existing site conditions and jobs procedure in stages.

SECTION THREE: ..... SPECIALIZED ENVIRONMENTS ..... 10 HOURS

A. Introduction to Specialized Environments ..... 6 Hours

Outcome: ***Recognize hazards associated with specialized environments.***

1. Define units of radiation.
2. Give an introduction to biological effects and somatic effects, with reference to:
   a) effects on skin
   b) effects of sex cell irradiation
   c) effects upon the eye
   d) effects upon the blood
   e) effects upon the body as a whole.
3. Explain the genetic effects, with reference to:
   a) mutations
   b) doubling dose.
4. Discuss the sources of radiation exposure:
   a) leakage
   b) primary
   c) scatter.
5. Show a perspective of risk.
6. Explain personnel monitoring.
7. Use measures to minimize radiation exposure.
8. Discuss regulations and protection recommendations.

B. Radiation Protective Systems ..... 4 Hours

Outcome: ***Recognize and comprehend types of radiation shielding to integrate the job process.***

1. Describe the following components.

a) lead protective shielding
b) framing and furring members
c) fasteners
d) adhesives
e) accessories.

2. Discuss framing and installation for:

a) layout
b) corner details
c) wall intersections
d) ceiling intersections
e) base intersections
f) openings - door, window, transfer cabinet.

3. Explain testing to ensure lead protective shielding provides full radiation protection for the specified project.

SECTION FOUR: ..... BLUEPRINT READING ..... 63 HOURS

A. Specifications ..... 10 Hours

Outcome: ***Interpret specifications in order to determine the scope of work.***

1. Study of a typical set of specifications, their scope and the determination of ambiguous or arbitrary sections.

B. Blueprints with Emphasis on Lather - Interior Systems Mechanic Role ..... 20 Hours

Outcome: ***Interpret and use a complete set of blueprints (working drawings) to complete a project.***

1. Adjust from small scale plan views to large scale details.
2. Draw quick pictorial drawings in freehand for clarification.
3. Make calculations for assigned problem solving arising from blueprint study.
4. Recognize change orders, addendums, etc.

C. Working Drawings ..... 22 Hours

Outcome: ***Prepare working drawings to assist in layout and construction of special items.***

1. Prepare working drawings for special detail items:

a) domed or groined ceilings
b) ceilings that incorporate recesses, troughs, steps, etc.

D. Job Organization ..... 11 Hours

Outcome: ***Use basic estimating and job coordination skills to manage daily job flow.***

1. Refer to blueprints, drawings and specifications for typical and unusual job demands, the coordination of work loads with other trades and various other concerns arising.
2. Calculate areas and material quantities from a building blueprint.

SECTION FIVE: .....BUSINESS FUNDAMENTALS..... 41 HOURS

A. Documents and Forms..... 6 Hours

Outcome: ***Prepare/comprehend documentation pertaining to projects.***

1. Prepare or accept typical documents, forms, etc. including:
   - a) delivery slips
   - b) time sheets
   - c) expense accounts
   - d) business letters
   - e) injury reports
   - f) purchase orders, etc.

B. Trade Math ..... 18 Hours

Outcome: ***Make calculations from specifications or plans.***

1. Make calculations from specifications or plans that include:
   - a) screens and hoarding
   - b) removal of old work
   - c) temporary shoring
   - d) new material
   - e) reusable's
   - f) scaffolding
   - g) housekeeping
   - h) off-site preparations
   - i) penalty clauses.
2. Estimating with unit costs.

C. Workplace Coaching Skills..... 5 Hours

Outcome: ***Display coaching skills.***

1. Describe coaching skills used for training apprentices.

D. Interprovincial Standards ..... 12 Hours

Outcome: ***Discuss Red Seal / Interprovincial standards.***

1. Describe the National Occupational Analysis (NOA).
2. Describe the relationship between the NOA and Red Seal / Interprovincial examinations.
3. Discuss the roles of federal and provincial government in the development of Red Seal standards.
4. Discuss the role of industry in the development of Red Seal standards.
5. Explain the intent of the Red Seal examination as it relates to interprovincial mobility.
6. Describe sources of information on Red Seal standards and practice examination.

TEXTBOOKS AND SUPPLIES LIST

Apprentices are advised not to purchase any items listed below until after meeting their instructor in the first class. However, if you already own some items listed below bring them with you. Textbooks and some supplies may be purchased from the training institute offering the program; also additional funds may be required to purchase supplies, handouts, etc.

First Period

A. Textbooks

1. NAIT Lather - Interior Systems Mechanic Notes Package.
2. Building Trades - Blueprint Reading - Part 1, Strinholm.

B. Supplies

1. 4 inch binder.
2. Casio "Fx 260 Calculator" (Fraction).
3. Pens.
4. 2H and 4H pencils.
5. Eraser - white plastic.
6. One padlock for student locker.
7. Suitable work clothing.
8. Measuring tape – Metric and Imperial.
9. Tool pouches.
10. CSA approved:
    a) Hard hat
    b) Safety glasses
    c) Steel-toed footwear.

Second Period

A. Textbooks

1. Same as for first period.

B. Supplies

1. Same as for first period.

Third Period

A. Textbooks

1. Same as for first period.

B. Supplies

1. Same as for first period.

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